

# THE RECENT AND FOSSIL MOLLUSKS OF THE GENUS CERITHIOPSIS FROM THE WEST COAST OF AMERICA.

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The first *Cerithiopsis* known from the west coast of America was reported by Alcide D'Orbigny in 1840 from Peru.<sup>1</sup> This was followed twelve years later by two additional species, discovered by Prof. C. B. Adams at Panama and described as *Cerithium neglectum* C. B. Adams and *Triforis infrequens* C. B. Adams.<sup>2</sup>

In 1857 Dr. P. P. Carpenter published that part of his Catalogue of Mazatlan Shells which deals with the members of this genus, citing the following species:

*tuberculoides* Carpenter.

*sorex* Carpenter.

*tuberculoides albonodosa* Carpenter.

*convexa* Carpenter.

*cerea* Carpenter.

*decussata* Carpenter.

*pupiformis* Carpenter.

*assimilata* C. B. Adams.

Of these, *C. convexa* is now placed in the genus *Metaxia*. *C. decussata* is a *Bittium*, and *Cerithiopsis assimilata* Carpenter = *Cerithium assimilatum* C. B. Adams must be referred to the genus *Seila*.

In 1865 Doctor Carpenter described *Cerithiopsis intercalaria*<sup>3</sup> and at the same time referred *Cerithium bimarginatum* C. B. Adams to this genus. At present both of these species are placed in the genus *Eumeta*. In the Supplementary Report on the Present State of Our Knowledge with Regard to the Mollusca of the West Coast of America<sup>4</sup> Doctor Carpenter published a terse diagnosis of the following species:

*Cerithiopsis columna*.

*Cerithiopsis purpurea*.

*Cerithiopsis munita*.

*Cerithiopsis fortior*.

All of these were later more fully described. Three of them, *C. munita*, *C. purpurea*, and *C. fortior*, are now placed in the genus *Bittium*. In 1867 De Folin added another species,<sup>5</sup> *Cerithium destrugesii*, which may not belong to our fauna, as the locality is cited as Panama or Negritos Island.

<sup>1</sup> Voy. Amer. Merid., p. 443, pl. 77, figs. 9-10.

<sup>2</sup> Ann. Lye. Nat. Hist. of N. Y., 1852, pp. 379-80.

<sup>3</sup> Proc. Zool. Soc., 1865, p. 281.

<sup>4</sup> Rep. Brit. Ass. Adv. Sci. for 1863, published in 1864.

<sup>5</sup> Les Meleagrinicoles, p. 71, pl. 6, fig. 12.

After this no additions were made for seventeen years, when Dr. W. H. Dall described *Cerithiopsis stejneri*, from Alaska.<sup>1</sup> Two years later the same author added another species,<sup>2</sup> also from Alaska, under the name *Cerithiopsis stejneri truncata*.

After another lapse of seventeen years we find another species added to our list, this time a fossil described as *Bittium williamsoni* by Dr. Ralph Arnold,<sup>3</sup> from the Pleistocene beds of San Pedro and San Diego, California. Five years later the present writer described:<sup>4</sup>

*Bittium tumidum*.

*Cerithiopsis cosmia*.

*Bittium quadrifilatum ingens*.

*Cerithiopsis pedroana*.

the first two of which must be referred to the present genus. Since then Doctor Dall has added *Cerithiopsis excelsus*,<sup>5</sup> and the present writer described *Cerithiopsis stephense*.<sup>6</sup>

The nuclear characters of the species studied are quite interesting and can be used to advantage in subdividing the genus into minor groups. Unfortunately, twenty of the forty-five forms under consideration have lost these early turns, which leaves a rather large percentage in an uncertain position.

Of the twenty-five species in which the nuclear whorls are known, eighteen belong to *Cerithiopsis* proper, having smooth nuclear whorls. These are:

*fatua* Bartsch.

*abreojosensis* Bartsch.

*oxyis* Bartsch.

*berryi* Bartsch.

*cerea* Carpenter.

*galapagensis* Bartsch.

*sorex* Carpenter.

*cesta* Bartsch.

*carpenteri* Bartsch.

*stejnegeri* Dall.

*pedroana* Bartsch.

*stejnegeri dina* Bartsch.

*tuberculoides* Carpenter.

*neglecta* C. B. Adams.

*tuberculoides albonodosa* Carpenter.

*halia* Bartsch.

*pupiformis* Carpenter.

*aurea* Bartsch.

Two species have the early portion of the nuclear whorls smooth and the later part axially ribbed; for these I would suggest the subgeneric name *Cerithiopsina*. The two species are *Cerithiopsis* (*Cerithiopsina*) *necropolitana* Bartsch and *Cerithiopsis* (*Cerithiopsina*) *adamsi* Bartsch. The first of these may be considered the type.

Two species have the early portion of the nuclear whorls smooth, which is succeeded by an axially ribbed part, which in turn is followed by a portion bearing two spiral cords in addition to the axial ribs. The last ornamentation resembles the sculpture of the early post-nuclear whorls, but is less strong, with many more axial ribs

<sup>1</sup> Proc. U. S. Nat. Mus., vol. 7, 1884, pp. 345-6, pl. 2, fig. 4.

<sup>2</sup> Proc. U. S. Nat. Mus., vol. 9, 1886, p. 304, pl. 4, fig. 5.

<sup>3</sup> Mem. California Acad. Sci., vol. 3, 1903, p. 295, pl. 6, fig. 11.

<sup>4</sup> Proc. U. S. Nat. Mus., vol. 33, 1907, pp. 79-82.

<sup>5</sup> Prof. Paper No. 59, U. S. Geol. Surv., 1909, p. 75.

<sup>6</sup> Proc. U. S. Nat. Mus., vol. 37, 1909, pp. 399-400 and figure.

than are present on the early post-nuclear turns. To this group I would apply the subgeneric name *Cerithiopsida*. The two species are *Cerithiopsis* (*Cerithiopsida*) *diegensis* Bartsch, which may be considered the type of the subgenus, and *Cerithiopsis* (*Cerithiopsida*) *rowelli* Bartsch.

A fourth group, consisting of three species, has the early portion of the nuclear turns smooth; the rest finely, axially ribbed, with the intercostal spaces finely, spirally lirate. For these I would suggest the subgenus *Cerithiopsidella*, with *Cerithiopsis* (*Cerithiopsidella*) *cosmia* Bartsch as type. The other two species are *Cerithiopsis* (*Cerithiopsidella*) *antefilosa* Bartsch and *Cerithiopsis* (*Cerithiopsidella*) *alcima* Bartsch.

The species in which the nuclear whorls are unknown are:

<i>excelsa</i> Dall.	<i>antemunda</i> Bartsch.
<i>curtata</i> Bartsch.	<i>diomedeeae</i> Bartsch.
<i>fossilis</i> Bartsch.	<i>williamsoni</i> Arnold.
<i>gloriosa</i> Bartsch.	<i>truncata</i> Dall.
<i>columna</i> Carpenter.	<i>stephensae</i> Bartsch.
<i>infrequens</i> C. B. Adams.	<i>montereyensis</i> Bartsch.
<i>paramoea</i> Bartsch.	<i>ingens</i> Bartsch.
<i>arnoldi</i> Bartsch.	<i>tumida</i> Bartsch.
<i>bicolor</i> Bartsch.	<i>peruviana</i> D'Orbigny.
<i>magellanica</i> Bartsch.	<i>destrugesi</i> De Folin.

Only five of the forty-four known species are fossils, and none, as far as known, occur both recent and fossil. Of these five, two have their nuclear characters well preserved and thus enable us to assign them to their proper positions. These are *Cerithiopsis* (*Cerithiopsis*) *fatua* Bartsch and *Cerithiopsis* (*Cerithiopsina*) *necropolitana* Bartsch. Both of these are from the Pleistocene of San Pedro, California. The other three species without the nuclear characters are *Cerithiopsis excelsa* Dall, from the Eocene of Oregon; *Cerithiopsis fossilis* Bartsch and *Cerithiopsis williamsoni* Arnold, from the Pleistocene of San Pedro, California.

It is hoped that the present paper may stimulate the west American collectors to be on the lookout for these charming little shells, and that their efforts will result in a speedy elimination of the species now referred to an uncertain position.<sup>1</sup>

<sup>1</sup> In the preparation of the present diagnoses the following terminology is used:

"Axial sculpture," the markings which extend from the summit of the whorls toward the umbilicus. The axial sculpture may be—

"Vertical," when the markings are in general parallelism with the axis of the shell.

"Protractive," when the markings slant forward from the preceding suture.

"Retractive," when the markings slant backward from the suture.

"Spiral sculpture," the markings following the directions of the coils of the whorls.

KEY TO THE GENUS CERITHIOPSIS.<sup>1</sup>

- Shell with varices.....*exelsa*.  
 Shell without varices.  
   Spiral cords between the sutures three.  
     Spiral cord at summit equal to the others in strength.  
       Sutures strongly channeled.  
         Shell of medium size, less than 6.5 mm. long.....*fatua*.  
         Shell minute; adult less than 4 mm. long.  
           Base with two spiral cords.  
             Shell elongate-conic.....*oxys*.  
             Shell elongate-ovate.....*curtata*.  
           Base with more than two spiral cords.  
             Spiral cords of base three.....*cerea*.  
             Spiral cords of base nine.....*sorex*.  
       Sutures not channeled.  
         Whorls shouldered at the summit  
         Base with strong spiral cords.  
           Shell large; adult more than 7 mm. long.  
             Spaces inclosed between axial ribs and spiral cords on the spire, large  
               squarish pits.  
               Base with a strong keel next to peripheral keel.....*fossilis*.  
               Base with no strong keel next to peripheral keel.....*gloriosa*.  
             Spaces inclosed between axial ribs and spiral cords on the spire, small  
               round pits.  
               Peripheral keel completely exposed in the suture in adult shells,  
               .....*columna*.  
               Peripheral keel never completely exposed in the suture in adult  
               shell.  
               Basal cords three, strong.....*cosmia*.  
               Basal cord single, feeble.....*carpenteri*.  
           Shell smaller.  
             Adult between 3 and 5 mm. long.  
               Basal cord broad and round.  
               Axial ribs on last whorl about 32.....*pedroana*.  
               Axial ribs on last whorl about 20.....*tuberculoides*.  
               Basal cords sublamellar.  
             Adult less than 3 mm. long.....*infrequens*.  
               Shell stout.....*pupiformis*.  
               Shell slender.....*abreojosensis*.  
           Base with feeble sculpture only.  
             Basal fasciole present.  
             Base with a single fasciole (encircling the columella) only.  
               Shell broadly elongate-conic.....*paramoea*.  
               Shell slender elongate-conic.....*necropolitana*.  
             Base with more cords than a single fasciole.....*arnoldi*.  
             Basal fasciole absent.  
             Whorls not shouldered at the summit.....*magellanica cesta*.  
       Spiral cord at summit weaker than the rest.  
         Sutures strongly channeled.  
         Shell robust.  
         Basal keels strong.....*berryi*.

<sup>1</sup>Since so many of the species under discussion lack the nucleus, it was deemed advisable to treat the genus as a unit and ignore the subgeneric division in this key, by utilizing characters present on the post-nuclear whorls only.



Basal keel obsolete.

Axial ribs retractive.....*antemunda*.

Axial ribs protractive.....*diomedex*.

Shell very slender.....*galapagensis*.

Sutures not channelled.

Tubercles of middle keel truncated on both posterior and anterior margin.

Axial ribs and spiral cords inclosing strong, squarish pits.

Base with two strong keels.

Adult shell more than 5 mm. long.....*alcima*.

Adult shell less than 3 mm. long.....*williamsoni*.

Base with a feeble fasciole only.....*truncata*.

Axial ribs and spiral cords inclosing rounded pits.

Spiral cords slender.....*cesta*.

Spiral cords very broad.

Shell very elongate-conic.....*stephensæ*.

Shell broadly conic.

Adult shell less than 6 mm. long.....*stejnegeri*.

Adult shell more than 7 mm. long.....*s. dina*.

Tubercles of middle keel not truncated on both posterior and anterior margin. Tubercles of middle keel truncated on posterior margin only.

Base marked by a slender fasciole only.....*rowelli*.

Base marked by spiral cords.

Spiral cords of base three.....*antefilosa*.

Spiral cords of base two.....*neglecta*.

Tubercles of middle keel not truncated.

Whorls strongly, slopingly shouldered at the summit.....*halia*.

Whorls not slopingly shouldered at the summit.

Shell robust.

Base with a single keel at the periphery.....*diegersis*.

Base with three keels near the periphery.....*montereyensis*.

Shell slender and minute.....*adamsi*.

Spiral cords between the sutures four.

Shell very large; adult more than 12 mm. long.

Intercalated cords absent or very fine.....*ingens*.

Shell smaller; adult less than 7 mm. long.

Spiral cords wider than the spaces which separate them.

Shell elongate-conic.....*tumida*.

Shell elongate-ovate.....*peruviana*.

Spiral cords narrower than the spaces which separate them.

Spiral cords subequal.....*aurea*.

Spiral cords decidedly unequal.....*destrugesi*.

CERITHIOPSIS (CERITHIOPSIS) FATUA, new species.

Plate 36, fig. 5.

Shell very elongate-conic, creamy white. Nuclear whorls three, strongly rounded, separated by well marked sutures, forming a slender, regular spire. Post-nuclear whorls well rounded, separated by a deeply channelled suture, ornamented with three nodulose, spiral cords one of which is at the summit, the third immediately above the periphery, while the second is median between the two. These cords are a little wider than the spaces which separate them. In addition to the spiral sculpture, the whorls are marked by retractive, axial

ribs which are as strong as the spiral cords and render the junctions with these nodulose. Of these ribs 16 occur upon the first to fifth, 18 upon the sixth, 20 upon the seventh, and 22 upon the penultimate turn. The spaces inclosed between the axial ribs and spiral cords appear as strongly impressed, rounded pits. The tubercles are slightly truncated posteriorly, sloping gently anteriorly. Periphery of the last whorl marked by a channel like those occurring between the spiral cords on the spire and like them crossed by the continuations of the axial ribs. Base rather long, well rounded, free from sculpture excepting very fine, incremental lines. Aperture regularly ovoid, strongly channeled anteriorly; posterior angle obtuse, outer lip thin, rendered wavy by the external sculpture; columella stout, decidedly curved and somewhat twisted, projecting considerably beyond the anterior margin of the outer lip.

The type and seven specimens (Cat. No. 195194, U.S.N.M.) come from the Lower Pleistocene (Lower San Pedro Series), Deadmans Island, California. The type has twelve whorls and measures: Length 6 mm., diameter 1.6 mm.

**CERITHIOPSIS (CERITHIOPSIS) OXYs, new species.**

Plate 36, fig. 2.

Shell minute, elongate-conic, dark brown. Nuclear whorls almost four, forming a slender, elongate-conic spire, having the whorls well rounded. Post-nuclear whorls well rounded, separated by a strongly channeled suture, marked by three equally strong, spiral cords, the first of which is at the summit, the third slightly above the periphery, while the second is median between these two. In addition to the spiral cords, the whorls are marked by vertical, axial ribs, almost as strong as the spiral cords. Of these ribs, 16 occur upon the first, 20 upon the second, 18 upon the third to fifth, and 24 upon the penultimate turn. The junctions of the axial ribs and spiral cords form strong tubercles of which those of the posterior cord are rounded while the other two are truncated posteriorly and slope gently anteriorly, while the spaces inclosed between the spiral cords and axial ribs are strongly impressed, rounded pits. Periphery of the last whorl marked by a strong cord which is feebly nodulose and separated from the tuberculate keel posterior to it by a channel as wide as those occurring on the spire; this channel is marked by the continuations of the axial ribs. Base moderately long, marked by a strong, spiral cord about halfway between the peripheral cord and the insertion of the columella, the spaces which separate it from the peripheral cord on one side and from the columella on the other, appearing as deep, rounded channels. Aperture rather small, irregularly ovate, very strongly channeled anteriorly; posterior angle obtuse; outer lip ren-

dered sinuous by the external sculpture; columella very stout, twisted revolute, and reflected; parietal wall glazed with a thin callus.

The type and another specimen (Cat. No. 106505, U.S.N.M.) come from Point Abreojos, Lower California. The type has seven post-nuclear whorls and measures: Length 3.3 mm., diameter 1.2 mm. Two additional specimens (Cat. No. 195181, U.S.N.M.) come from San Pedro Bay, California.

**CERITHIOPSIS (CERITHIOPSIS) CEREA** Carpenter.

Plate 37, fig. 6.

*Cerithiopsis cerea* CARPENTER, Cat. Maz. Shells, 1857, p. 443.

Shell small, broadly conic, semitransparent, light horn-color. Nuclear whorls well rounded. Post-nuclear whorls separated by a strongly channeled suture, marked by three spiral cords, the first of which is a little anterior to the summit, the second median, and the third a little posterior to the suture. In addition to the spiral cords, the whorls are marked by axial ribs which equal the spiral cords in strength. Of these ribs, 12 occur upon the first to third, 14 upon the fifth and sixth, and 22 upon the penultimate turn. The junctions of the spiral cords and the axial ribs form prominent tubercles, while the spaces inclosed between them are elongated, oval pits on the early whorls, having their long axes parallel to the spiral sculpture. On the last volution they are rounded. Periphery of the last whorl marked by a strong channel. Base moderately long, well rounded, marked by three strong, spiral keels, of which the first is immediately below the peripheral sulcus, and the second halfway between this and the cord which surrounds the insertion of the columella. In addition to the spiral cords, the base is marked by numerous, fine incremental lines. Aperture irregular, very strongly channeled anteriorly; posterior angle obtuse; edge of outer lip rendered sinuous by the external sculpture; columella moderately long, twisted, with the edge reflected.

Doctor Carpenter's type is on Tablet No. 2030, Liverpool collection, British Museum, and was collected on *Spondylus* at Mazatlan. It has seven post-nuclear whorls and measures: Length 2.4 mm., diameter 1 mm.

**CERITHIOPSIS (CERITHIOPSIS) SOREX** Carpenter.

Plate 37, fig. 2.

*Cerithiopsis sorex* CARPENTER, Cat. Maz. Shells, 1857, p. 444.

Shell minute, pupiform. Nuclear whorls three, smooth, well rounded, forming a slender, mucronate apex. The first three post-nuclear whorls increasing very rapidly in size, well rounded, ornamented with three spiral cords, of which the first is a little anterior

to the summit, the second median, and the third a little posterior to the suture. In addition to the spiral cords, the whorls are marked by retractive axial ribs which are almost as strong as the spiral cords. Of these ribs, 16 occur upon the second, 18 upon the third, and 20 upon the penultimate whorl. The junctions of the axial ribs and the spiral cords form prominent tubercles, while the spaces inclosed between them are elongated pits on the second whorl and well-rounded, well-impressed pits on the remaining ones. Sutures channeled. Periphery of the last whorl marked by a deep sulcus which is crossed by the continuations of the axial ribs which extend to the posterior edge of the first basal cord. Base moderately long, concave in the middle, marked by eight low, rounded, subequally spaced, spiral cords, which grow successively weaker from the periphery toward the tip of the columella. Aperture irregular, decidedly channeled anteriorly; posterior angle acute; outer lip rendered sinuous at the edge by the external sculpture; columella moderately long, twisted, the edge reflected, and joined to the posterior angle of the aperture by a strong callus which covers the parietal wall.

The type, which is on Tablet No. 2032, Liverpool collection, British Museum, has five post-nuclear whorls and measures: Length 1.6 mm., diameter 0.7 mm. It and three additional specimens were found on *Spondylus* at Mazatlan.

**CERITHIOPSIS (CERITHIOPSIS) CARPENTERI, new species.**

Plate 38, fig. 9.

Shell broadly elongate-conic, dark chocolate brown. Nuclear whorls three, smooth, well rounded, separated by a slender suture, forming an elongate-conic spire. Post-nuclear whorls well rounded, marked by three strong, broad, spiral bands which are as wide as the spaces that separate them. Of these, the first and widest is at the summit, the next is median, while the third is a little posterior to the suture. In addition to the spiral keels, the whorls are marked by slender, rounded, axial ribs which are about half as wide as the spiral cords. Of these ribs, 20 occur upon the first and second, 22 upon the third to fifth, 24 upon the sixth and seventh, 28 upon the eighth, and 30 upon the penultimate turn. The junctions of the axial ribs and spiral cords form strong, elongated tubercles, having their long axes parallel with the axial sculpture. The tubercles at the summit are well rounded anteriorly and posteriorly; those of the median series are a little more suddenly rounded anteriorly than posteriorly; while those belonging to the supraperipheral cord are truncated suddenly posteriorly and slope gently anteriorly. The spaces between the spiral cords and axial ribs are small, moderately rounded, well-impressed pits. Suture constricted, showing a portion of the basal cord. Periphery of the last whorl marked by a deep, spiral groove as wide as

that separating the first suprapерipheral cord from the median spiral cord and, like it, crossed by the continuations of the axial ribs. Base short, well rounded, marked by a broad, spiral cord which is truncated posteriorly and slopes gently anteriorly toward the shallow, well-marked groove which separates it from the base proper. Entire surface of spire and base marked by numerous, very slender, incremental lines. Aperture irregularly oval, very strongly channeled anteriorly; posterior angle obtuse; outer lip thin, showing the external sculpture within, rendered decidedly sinuous at the edge by the external sculpture; columella stout, moderately long, the edge reflected; parietal wall glazed with a thin callus.

The above description is based upon the two cotypes which, together with 130 specimens, are registered as Cat. No. 109510, U.S.N.M., and come from Terminal Island, California. One of these specimens is a young individual consisting of the three nuclear whorls and six post-nuclear whorls; the other is an adult which has lost the nuclear whorls and has ten post-nuclear whorls which measure: Length 8.1 mm., diameter 2.8 mm.

Named for the late Dr. Philip P. Carpenter.

Specimens examined.

Catalogue No.	Locality.	Number of specimens.
<sup>1</sup> 109510	Terminal Island, California.....	132
109511	.....do.....	1
173088	.....do.....	21
73725	San Pedro, California.....	1
195178	White's Point, San Pedro Bay, California.....	2
152758	Alamitos Bay, California.....	35
159330	San Diego, California.....	5
134857	.....do.....	3
<sup>1</sup> 15653	.....do.....	1
<sup>1</sup> 130584	San Diego, California (on sponge).....	4
56005	San Diego, California.....	17
32219	.....do.....	15
32287	.....do.....	114
130315	False Bay, San Diego, California.....	1
3566	San Diego Bay, California (3 fathoms, sand and shell bottom, bottom temperature 58°).....	1
32220	San Diego, California.....	48
56006	.....do.....	18
123401	San Diego, California (living on sponges).....	2

<sup>1</sup> Cotypes.

CERITHIOPSIS (CERITHIOPSIS) PEDROANA Bartsch.

Plate 38, fig. 2.

*Cerithiopsis pedroana* BARTSCH, Proc. U. S. Nat. Mus., vol. 33, 1907, pp. 181-182.

Shell small, slender, dark brown. Nuclear whorls three, yellowish-white, smooth. Post-nuclear whorls strongly differentiated from the nuclear ones, showing the sculpture characteristic of the adult shell from the very beginning. This sculpture consists of three equally spaced tuberculate spiral keels between the sutures, the posterior one of which is slightly smaller than the other two. These keels are sepa-



rated by deep, rounded channels almost as wide as the keel. In addition there are many low, rather broad axial ribs, the intersections of which with the keel form the tubercles. About 20 of them occur upon the first, 22 upon the fifth, and 30 upon the penultimate post-nuclear turn. The connections between the tubercles, both spiral and axial, are about equal, inclosing deep, squarish pits. In addition to the above sculpture the entire surface is marked by fine spiral lines and lines of growth. Sutures strongly marked, constricted, showing the peripheral keel in the later whorl. Periphery marked by a broad, low, rounded keel. Another of equal width is located upon the middle of the base. The sulcus which separates these keels and the supra-peripheral sulcus are of equal width; both are crossed by the weak continuations of the axial ribs, which gradually weaken as they pass toward the columella. The basal keel is separated from the columella by broad, shallow grooves. Aperture irregularly oval, decidedly channeled anteriorly, outer lip thin, rendered sinuous by the external keel; columella stout and somewhat twisted, with a strong callus on its inner edge that extends over the parietal wall.

The two cotypes, Cat. No. 109512, U.S.N.M., were collected by Mrs. W. H. Eshnaur at Terminal Island, San Pedro, California. The one has the nucleus and three post-nuclear whorls; the other has lost the nucleus and has nine post-nuclear turns and measures: Length 5.2 mm., diameter 1.8 mm.

*Specimens examined.*

Catalogue No.	Locality.	Number of specimens.
<sup>1</sup> 109512	Terminal Island, California.....	350
56751	Catalina Island, California.....	1
195179	San Pedro, California.....	3
14825	do.....	1
195180	White's Point, San Pedro, California.....	1
73725a	San Pedro, California.....	1
130584	San Diego, California.....	9
32287a	do.....	40
32220b	do.....	13
56006a	do.....	3
123401	do.....	6
109364	do.....	1
199179	do.....	1
153058	Government Jetty, San Diego, California.....	7
106504	Point Abrejos, Lower California.....	1
32292	Todos Santos Bay, Lower California.....	1

<sup>1</sup> Cotypes.

**CERITHIOPSIS (CERITHIOPSIS) TUBERCULOIDES** Carpenter.

Plate 37, fig. 7.

*Cerithiopsis tuberculoides* CARPENTER, Cat. Maz. Shells, 1857, pp. 442-443.

Shell elongate-conic. Nuclear whorls five, well rounded, smooth, separated by a moderately constricted suture forming a well elevated spire. Post-nuclear whorls moderately rounded, ornamented with

three spiral cords of which the first is a little below the summit, the second median and the third a little posterior to the suture. These cords are separated by spaces a little wider than the cords. In addition to the spiral sculpture, the whorls are marked by decidedly retractive, axial ribs which are about as strong as the spiral cords. Of these ribs, 12 occur upon the first and second, 14 upon the third, 18 upon the fourth, and 20 upon the penultimate whorl. The junctions of the axial ribs and spiral cords form well rounded tubercles, while the spaces enclosed between them are deep, rounded pits. Sutures moderately constricted. Periphery of the last whorl marked with a strong, smooth, spiral cord which is separated from the first suprapерipheral cord by a channel as wide as that which separates the suprapерipheral cord from the median and, like it, is crossed by the continuations of the axial ribs, which extend to the posterior edge of the peripheral cord. Base moderately long, well rounded, marked by two broad rounded, spiral cords. Aperture irregularly oval, decidedly channeled anteriorly; posterior angle obtuse; outer lip rendered sinuous by the external sculpture; columella curved, twisted, the edge reflected; parietal wall covered with a thick callus.

Nine specimens of this species were reported by Doctor Carpenter taken from *Spondylus* and *Chama* at Mazatlan. The cotypes are on Tablet 2028, Liverpool collection, British Museum. The larger, a perfect specimen with seven post-nuclear whorls, measures: Length 3.75 mm., diameter 1.2 mm. Our figure is after a camera lucida sketch of the type by Doctor Carpenter.

*CERITHIOPSIS* (*CERITHIOPSIS*) *TUBERCULOIDES*, var. *ALBONODOSA* Carpenter.

Plate 37, fig. 3.

*Cerithiopsis* ? *tuberculoides albonodosa* CARPENTER, Cat. Maz. Shells, 1857, p. 443.

Of this Doctor Carpenter says:

Shell similar to *tuberculoides* with the tubercles more distant and white. Nuclear whorls four, less elevated and subcarinate.

Tablet 2029, Liverpool collection, British Museum, contains a young shell and a fragment of an adult shell taken from *Spondylus* at Mazatlan, Mexico.

Our figure is after a camera lucida sketch of the type by Doctor Carpenter.

*CERITHIOPSIS* (*CERITHIOPSIS*) *PUPIFORMIS* Carpenter.

Plate 38, figs. 1 and 5.

*Cerithiopsis pupiformis* CARPENTER, Cat. Maz. Shells, 1857, pp. 443-444.

Shell minute, elongate-conic, brown. Nuclear whorls four, smooth, separated by a constricted suture forming a mucronate apex. Post-nuclear whorls marked by three spiral cords of which the first is at

the summit, the third immediately posterior to the suture, while the second is half way between these two. These cords are a little wider than the spaces that separate them. In addition to the spiral cords, the whorls are marked by somewhat retractive, axial ribs a little less strong than the spiral cords. Of these 20 occur upon the second, 22 upon the third and fourth, and 24 upon the penultimate turn. The junctions of the axial ribs and spiral cords form well rounded tubercles, while the spaces between them are small rounded pits. Sutures well impressed. Periphery of the last whorl marked by a deep spiral sulcus. Base moderately long with two tumid, broad, rounded, spiral cords. Aperture irregularly oval, decidedly channeled anteriorly; posterior angle obtuse; outer lip rendered sinuous by the external sculpture; columella curved and twisted, with the edge reflected; parietal wall covered with a thick callus.

Tablet 2031, Liverpool collection, British Museum, contains Doctor Carpenter's two cotypes which were collected on *Spondylus* at Mazatlan, Mexico. The largest of these cotypes measures: Length 1.9 mm., diameter 0.3 mm. Our figure is after a camera lucida drawing by Doctor Carpenter of the type.

**CERITHIOPSIS (CERITHIOPSIS) ABREOJOSENSIS**, new species.

Plate 37, fig. 4.

Shell minute, elongate-conic, brown, excepting the nuclear whorls which are white. Nuclear whorls four and one-half, well rounded, smooth, separated by a moderately constricted suture, forming an elevated, cylindric spire which gives the apex of the shell a mucronate appearance. Post-nuclear whorls very slightly rounded, ornamented by three spiral cords, the first of which is at the summit, the second at the anterior termination of the posterior third between the sutures, while the last is considerably posterior to the suture. The median cord, therefore, is much nearer the cord at the summit than that at the suture. In addition to these spiral cords, the whorls are marked by very slightly retractive, axial ribs which are almost as strong as the spiral cords. Of these ribs 16 occur upon all but the penultimate turn, which has 18. The junctions of the axial ribs and the spiral cords form well rounded tubercles, while the spaces enclosed between them are elongated slits between the first and second spiral cords and elongated, almost squarish pits between the median and the peripheral cord. Sutures strongly constricted. Periphery of the last whorl marked by a spiral sulcus as wide as that which separates the supraperipheral cord from the median cord between the sutures, and crossed by the continuations of the axial ribs. Base moderately long, marked by two strong, spiral cords, one of which is immediately below the periphery, while the other is a little posterior to the middle of the base, the two being separated by a channel equaling the periph-

eral one in width. In addition to the above sculpture, the base is marked by weak incremental lines. Aperture irregularly ovate, very strongly channeled anteriorly; posterior angle obtuse; outer lip thin, rendered somewhat sinuous by the external sculpture; columella stout, curved, and somewhat twisted, the edge reflected; parietal wall glazed with a thick callus.

The type (Cat. No. 106506, U.S.N.M.) comes from Point Abrejos, Lower California. It has six post-nuclear whorls and measures: Length 2.3 mm., diameter 0.8 mm.

**CERITHIOPSIS (CERITHIOPSIS) BERRYI, new species.**

Plate 39, fig. 8.

Shell small, elongate-conic, brown. Nuclear whorls four, well rounded, separated by constricted sutures, smooth, forming a mucronate apex to the shell. Post-nuclear whorls strongly sculptured, having three spiral cords between the sutures, of which the one at the summit is much smaller than the rest on the early whorls; the other two are subequal in strength, the second one being close to the one at the summit, while the third is almost halfway between the second and the suture. On the last whorl, the cord at the summit is almost equal to the other two. In addition to the spiral sculpture, the whorls are marked by vertical axial ribs which are stronger than the spiral cords. Of these ribs, 12 occur upon the second, 16 upon the third to fifth, 18 upon the sixth, and 20 upon the penultimate turn. The junctions of the axial ribs and spiral cords form strong tubercles, which are truncated posteriorly and slope gently anteriorly. The spaces inclosed between them are elongated, narrow pits between the first and second spiral cords on the early whorls, while on the last they are squarish pits in this region. The spaces between the median and supraparipheral cord are strongly impressed, large, squarish pits on all the whorls. Sutures strongly channeled. Periphery of the last whorl marked by a broad sulcus, equaling that which separates the supraparipheral from the median cord, crossed by the continuations of the axial ribs. Base marked by a strong, broad, rounded cord immediately below the periphery and a second less strong on its middle, while a slender thread encircles the insertion of the columella. In addition to this sculpture, the base is marked by strong, incremental lines. Aperture irregularly oval, decidedly channeled anteriorly; posterior angle obtuse; outer lip thin, showing the external sculpture within, rendered sinuous at the edge by the external sculpture; columella stout, curved, strongly twisted, with the edge reflected; parietal wall glazed with a thick callus.

The type and two additional specimens (Cat. No. 195182, U.S.N.M.) were dredged by Mr. S. S. Berry in 12 fathoms off Del Monte, Monterey, California. The type has lost the nucleus, the eight post-nuclear



whorls measuring: Length 3.4 mm., diameter 1.3 mm. The nucleus was described from one of four specimens (Cat. No. 195198*a*, U.S.N.M.) from Whites Point, San Pedro, California. Cat. No. 195183, U.S.N.M., contains seven specimens from Monterey, and Cat. No. 195184, U.S.N.M., contains four specimens from San Pedro Bay, California.

CERITHIOPSIS (CERITHIOPSIS) GALAPAGENSIS, new species.

Plate 39, fig. 4.

Shell minute, regularly elongate-conic, golden brown, with the row of tubercles at the summit of the shell darker. Nuclear whorls five, well rounded, smooth, separated by a well-impressed suture. Post-nuclear whorls moderately rounded, ornamented with three tuberculate, spiral cords, of which the first (which is at the summit) is considerably less strong than the other two; the third is immediately above the suture, while the second is considerably nearer the first than the third. The space between the first and second is about half the width of the middle cord, while that between the second and third is equal to it. In addition to the spiral cords, the whorls are marked by axial ribs, which are about equal to the spiral cords in strength; of these ribs, 16 occur upon all but the penultimate whorl, which has 20. The intersections of the axial ribs and spiral cords form prominent tubercles, which are truncated posteriorly and slope gently anteriorly, while the spaces inclosed between them are elongated pits between the first and second spiral cords, having their long axes parallel with the spiral sculpture, and squarish pits between the second and third cords. Sutures strongly channeled. Periphery of the last whorl marked by a channel almost as wide as that which separates the suprapерipheral cord from the median and, like it, crossed by the continuations of the axial ribs. Base moderately long, concave, marked by a strong spiral cord immediately below the peripheral sulcus, and another almost as strong which encircles the columella at its insertion. In addition to the spiral sculpture, the base is marked by fine, incremental lines. Aperture irregularly triangular, strongly channeled anteriorly, very effuse and angulated at the junction of the basal and outer lip; posterior angle very obtuse; outer lip thin, showing the external sculpture within, rendered sinuous at the edge by the external sculpture; columella moderately long, stout, curved, with the edge reflected; parietal wall covered with a thick callus.

The type and two additional specimens (Cat. No. 195185, U.S.N.M.) were dredged by the U. S. Bureau of Fisheries steamer *Albatross* at station 2813 in 40 fathoms, on coral sand bottom, bottom temperature 81°, off Galapagos Islands. The type is a perfect specimen, having six post-nuclear whorls and measures: Length 2.4 mm.,



diameter 0.8 mm. Cat. No. 195187, U.S.N.M., contains three specimens from the same locality. Cat. No. 122128, U.S.N.M., contains two specimens dredged off Indefatigable Island, Galapagos Islands.

*CERITHIOPSIS* (*CERITHIOPSIS*) *CESTA*, new species.

Plate 39, fig. 5.

Shell elongate-conic, chestnut brown. Nuclear whorls, three, well rounded and smooth forming a slender elongate spire. Post-nuclear whorls strongly rounded, marked with three feebly tuberculated spiral keels between the sutures of which the posterior is at the summit and the anterior at some little distance posterior to the suture, the median one being a little nearer the anterior than its other neighbor. The spaces between these keels are not quite as wide as the keels. In addition to the spiral keels, the whorls are marked with feeble, somewhat irregular axial riblets which are less than half as strong as the spiral keels; of these ribs, 14 occur upon the third and 32 upon the remaining whorls. These ribs render their junction with the spiral cords feebly nodulose. The spaces inclosed between the spiral cords and the axial ribs are feebly impressed, squarish pits. In addition to the above sculpture, the entire surface of the shell is crossed by fine incremental lines and very fine spiral striations. Sutures strongly impressed, with the peripheral cord showing as a slender, smooth band in all but the first two whorls. Periphery of the last whorl marked by a broad, depressed spiral cord which is separated from the first suprasutural cord of the spire by a sulcus as wide as that separating this cord from its posterior neighbor. This groove is crossed by the continuations of the axial ribs. Base large, moderately rounded, marked with a slender spiral cord which is a little nearer the peripheral cord than the slender fasciole at the insertion of the columella. Aperture irregularly ovate; outer lip thin, rendered sinuous at the edge by the external sculpture showing the external sculpture within; columella stout, rather long, twisted and curved; parietal wall glazed with a thin callus. The above description is based on two individuals, one an adult (Cat. No. 153057, U.S.N.M.) collected at the Government Jetty, San Diego, California. This has lost all but the last nuclear whorl, having eight post-nuclear whorls and measuring: Length 5.8 mm., diameter 2.1 mm. The other is one of three specimens (Cat. No. 160079 U.S.N.M.) collected at San Diego. This has the nucleus and six post-nuclear whorls and measures: Length 3.2 mm., diameter 1.6 mm.

## CERITHIOPSIS (CERITHIOPSIS) STEJNEGERI Dall.

Plate 40, fig. 3.

*Cerithiopsis stejnegeri* DALL, Proc. U.S. Nat. Mus., vol. 7, 1884, pp. 345-346, pl. 2, fig. 4.

Shell broadly conic, light chestnut brown, excepting the nucleus and the columella. Nuclear whorls two, strongly rounded, smooth. Post-nuclear whorls well rounded, marked with three nodulose spiral keels, of which one is at the shouldered summit, another somewhat posterior to the suture, while the third is median between the two. The anterior of the three is the stronger and the one at the summit the weakest. These cords are about as wide as the spaces that separate them. In addition to the spiral cords the whorls are marked by very poorly developed, almost vertical axial riblets, the junctions of which with the spiral cords form the nodules. Of these ribs 16 occur upon the second, 18 upon the third, 22 upon the fourth, 24 upon the fifth, and 26 upon the penultimate whorl. The spaces inclosed between the spiral cords and axial ribs are irregular, shallow, impressed, rounded pits. Sutures strongly constricted, showing the posterior edge of the base. Periphery of the last whorl marked by a sulcus which is crossed by the feeble axial riblets; base well rounded, smooth, excepting incremental lines. Aperture broadly ovate; decidedly channeled anteriorly; posterior angle obtuse; outer lip thin, rendered wavy by the external sculpture showing the external sculpture within; columella short, stout, twisted, and curved; parietal wall glazed with a thin callus which extends from the inner edge of the columella to the posterior angle of the aperture.

The type (Cat. No. 40932, U.S.N.M.) was collected by Dr. L. Stejneger at Bering Island. It has eight post-nuclear whorls, having lost the nuclear turns and measures: Length 5.5 mm., diameter 2.2 mm. The nuclear whorls were described from a specimen of Cat. No. 195172, U.S.N.M.

*Specimens examined.*

U.S.N.M. Cat. No.	Locality.	Number of specimens.
140932	Bering Island.....	1
161049	Kyska Harbor, Aleutian Islands, Alaska.....	1
195172	Amchitka Islands, Aleutian Islands, Alaska.....	28
130625	Amchitka Islands, Aleutian Islands, Alaska (low water).....	4
195174	Constantine Harbor, Aleutian Islands, Alaska.....	4
161108	do.....	4
161036	Captains Harbor, Unalaska, Aleutian Islands, Alaska.....	1
195173	East side Simeonoff Island, Shumagin Islands, Alaska.....	5

<sup>1</sup> Type.

## CERITHIOPSIS (CERITHIOPSIS) STEJNEGERI DINA, new subspecies.

Plate 40, fig. 7.

This is the southern representative of *C. stejnegeri*, differing from the species in having the sculpture much more strongly pronounced and in being larger. Three specimens are known (Cat. No. 195175, U.S.N.M.) which come from Sitka, Alaska. The type has three nuclear whorls and seven post-nuclear whorls and measures: Length 7 mm., diameter 2.6 mm.

## CERITHIOPSIS (CERITHIOPSIS) NEGLECTA C. B. Adams.

Plate 40, fig. 5.

*Cerithium neglectum* C. B. ADAMS, Ann. N. Y. Lyceum Nat. Hist., vol. 5, 1852, p. 378.

Shell minute, elongate-conic, dark brown excepting the nuclear whorls, which are white. Nuclear whorls at least four, well rounded, smooth, forming a mucronate apex. Post-nuclear whorls ornamented with three spiral cords, the first of which is very feeble on the early whorls and even less strong than the other two on the last volution; the second cord is at the posterior termination of the anterior third between the sutures, while the third is a little nearer the suture than the median. The first and second are only about half as far apart as the median and third. In addition to the spiral sculpture, the whorls are marked by retractive axial ribs, which are about as strong as the spiral cords. Of these ribs, 16 occur upon the first, 14 upon the second to fourth, 16 upon the fifth and sixth, and 18 upon the penultimate turn. The intersections of the axial ribs and the spiral cords form strong, cusped tubercles. Those on the first spiral cord are the weakest and are well rounded; those on the second and third are truncated posteriorly and slope less abruptly anteriorly. The spaces inclosed between the axial ribs and spiral cords are elongated pits between the first and second spiral cords, having their long axes parallel to the spiral sculpture, while those between the second and third are strongly impressed, squarish pits. Suture strongly constricted. Periphery of the last whorl marked by a strong, spiral cord, separated from the supra-sutural cord by a sulcus as wide as that which separates the supra-sutural from the median and, like this, crossed by the continuations of the axial ribs, which terminate at the posterior edge of the peripheral cord. Base moderately long, ornamented with two spiral cords. Aperture irregularly subquadrate, decidedly channeled anteriorly; posterior angle acute; outer lip rendered wavy by the external sculpture, which is apparent within the aperture; columella short, stout, curved, with the free edge reflected; parietal wall covered

with a thick callus which connects the columella with the posterior angle of the aperture.

The specimen described and figured (Cat. No. 211566, U.S.N.M.) is one collected by Prof. C. B. Adams at Panama. It has eight post-nuclear whorls and measures: Length 3.2 mm., diameter 1.1 mm.

*CERITHIOPSIS (CERITHIOPSIS) HALIA*, new species.

Plate 40, fig. 8.

Shell small, broadly elongate-conic, chocolate brown. (Early nuclear whorls decollated.) Only the last volution remains, which is smooth. Post-nuclear whorls strongly shouldered at the summit on the early whorls, ornamented with three spiral cords, of which the first, at the summit, is very poorly developed; the second is situated at the posterior termination of the anterior third between the sutures; while the third, which equals the second, is about halfway between this and the suture. In addition to the spiral cords, the whorls are marked by decidedly retractive, axial ribs which are almost equal to the spiral cords in strength. Of these ribs, 12 occur upon the first, 14 upon the second, 16 upon the third and fourth, 18 upon the fifth, and 20 upon the penultimate turn. The intersections of the axial ribs and spiral cords form well-rounded tubercles, while the spaces inclosed by them are elongated pits between the first and second spiral cord, and large, squarish pits between the second and third. Periphery of the last whorl marked by a sulcus not quite as broad as that which separates the suprapерipheral from the median cord, and crossed by the continuations of the axial ribs. Base short, concave, marked by two spiral cords immediately below the peripheral sulcus and by numerous fine, incremental lines. Aperture subquadrate, decidedly channeled anteriorly; posterior angle obtuse; outer lip rendered sinuous at the edge by the external sculpture which is apparent in the aperture; columella short, curved, and twisted, with the free edge reflected; parietal wall glazed with a thin callus.

We have seen three specimens of this species, none of them quite mature. Cat. No. 32399, U.S.N.M., contains the type and another specimen from Todos Santos Bay, Lower California. The type has eight post-nuclear whorls and measures: Length 4.5 mm., diameter 2.1 mm. The third specimen (Cat. No. 16196, U.S.N.M.) comes from Cape San Lucas, Lower California.

*CERITHIOPSIS (CERITHIOPSIS) AUREA*, new species.

Plate 40, fig. 1.

Shell elongate-conic, bright, light chestnut brown, excepting the extreme apex, which is wax yellow. Early nuclear whorls decollated; the last one only remains and is well rounded and smooth. Post-nuclear whorls well rounded, appressed at the summit; marked

by three nodulose, spiral cords which divide the spaces between the sutures into four equal parts. In addition to the spiral cords, the shell is marked with well-rounded, vertical, axial ribs which extend from the summit to the suture and are as strong as the spiral cords, rendering their intersections with them strongly tuberculate. Of these ribs, 16 occur upon the first, 18 upon the second to fifth, and 24 upon the penultimate turn. The spaces inclosed between the spiral cords and axial ribs are deep, squarish pits, except on the last whorl, on which they are rectangular, having their long axes coinciding with the axial ribs. In addition to the above sculpture, the entire surface of the spire is marked by very fine lines of growth and numerous microscopic, spiral striations. Suture well impressed, in the last two turns showing the posterior edge of the peripheral cord as a slender, raised thread. Periphery of the last whorl marked by a strong, smooth, spiral cord; the sulcus which separates this keel from the suprapерipheral cord is crossed by the strong continuations of the axial ribs. Base decidedly concave between the peripheral cord and the slender, basal fasciole which is at the insertion of the columella; marked by rather strong lines of growth and fine microscopic, spiral striations. Aperture broadly ovate; decidedly channeled anteriorly; posterior angle obtuse; outer lip thin, rendered sinuous by the external sculpture which shows strongly within; columella short, very broad at base, curved and somewhat twisted; parietal wall glazed with a thin callus.

The type (Cat. No. 16196, U.S.N.M.) has seven post-nuclear whorls and measures: Length 7 mm., diameter 2.4 mm. It was collected by Xantus at Cape San Lucas, Lower California.

*CERITHIOPSIS* (*CERITHIOPSINA*) *NECROPOLITANA*, new species.

Plate 39, fig. 1.

Shell almost cylindro-conic, creamy white. Nuclear whorls two, a little wider than the first post-nuclear whorl succeeding them; first half smooth, the rest marked by strong, slightly retractive, sublamellar, axial ribs, of which 14 occur upon the first whorl and 17 upon the second. Post-nuclear whorls moderately rounded, ornamented with three spiral cords, the first of which is at some little distance below the summit, giving this a decidedly shouldered aspect, while the third is an equal distance posterior to the suture, the second being halfway between the two. In addition to the spiral cords, the whorls are marked by vertical, axial ribs, almost equaling the spiral cords in strength; of these ribs, 14 occur upon the first, 16 upon the second to sixth, 18 upon the seventh, and 22 upon the penultimate turn. The junctions of the axial ribs and spiral cords form strong, cusp-like tubercles which are elongate on the first spiral cord, having their long axes parallel to the spiral sculpture, and are suddenly



truncated posteriorly on the second and third cords, sloping gently anteriorly. The spaces inclosed between the spiral cords and axial ribs are rectangular pits, having their long axes parallel to the spiral sculpture. The axial ribs extend prominently to the appressed summit of the whorls, forming a series of pits above the first spiral cord. Suture strongly constricted, showing the posterior edge of the base in all the turns. Periphery of the last whorl marked by a sulcus not quite as wide as that which separates the second and third cords and, like it, crossed by the continuations of the axial ribs. Base moderately long, smooth except for incremental lines, the peripheral sulcus giving the posterior edge of the base a decidedly angulated aspect. Aperture irregularly, broadly oval, decidedly channeled anteriorly; posterior angle very obtuse; outer lip rendered sinuous by the external sculpture; columella strongly curved and twisted, the free edge reflected; parietal wall covered with a moderately thick callus.

The type is a perfect specimen of nine post-nuclear whorls and measures: Length 7.7 mm., diameter 1.8 mm. It and seven additional specimens (Cat. No. 195205, U.S.N.M.) came from the Lower San Pedro Series, Deadmans Island, California.

*CERITHIOPSIS (CERITHIOPSIS) ADAMSI*, new species.

Plate 41, fig. 1.

Shell minute, elongate-conic, dark brown. Nuclear whorls three and one-half, of which the first one and one-half are smooth, while the succeeding two are marked by slender, axial riblets, 30 of which occur upon the last and 24 upon the preceding turn. Post-nuclear whorls moderately rounded, marked by three spiral cords, of which the first, which is at the summit, is more poorly developed than the other two, which are equal. These two cords divide the remainder of the whorls between the sutures into three equal areas. In addition to the spiral sculpture, the whorls are marked by axial ribs which are almost as strong as the spiral cords. Of these ribs, 16 occur upon the second and third, 18 upon the fourth, and 24 upon the penultimate turn. The junctions of the axial ribs and spiral cords form well-rounded tubercles, while the spaces inclosed between them are strongly impressed, rectangular pits. Suture strongly impressed. Periphery of the last whorl marked by a broad sulcus which equals the sulcus between the supraperipheral and the median cord in width and, like this, is crossed by the continuations of the axial ribs, which extend to the posterior edge of the first basal cord. Base moderately long, well rounded, marked by two strong, spiral cords, the stronger of which is immediately below the peripheral sulcus, while the other is a little posterior to the insertion of the columella. Aperture broadly

oval, decidedly channeled anteriorly; posterior angle obtuse; outer lip rendered sinuous by the external sculpture, which is apparent within the aperture; columella very short, very broad and curved, with the free edge reflected; parietal wall glazed with a thin callus.

The type (Cat. No. 3775, U.S.N.M.) comes from Panama. It has six postnuclear whorls and measures: Length 2.1 mm., diameter 0.7 mm.

Named for the late Prof. C. B. Adams.

*CERITHIOPSIS* (*CERITHIOPSIDA*) *DIEGENSIS*, new species.

Plate 40, fig. 4.

Shell small, broadly elongate-conic, chestnut brown. Nuclear whorls two and one-half; the first half smooth; the next turn has about 20 slender, axial threads; while the last whorl has about 32 axial threads and 2 spiral cords, the first of which is on the middle of the whorl, and the second one about halfway between this and the suture. The early post-nuclear whorls have 2 spiral cords, like the last of the nuclear whorls. Beginning with the third turn, a slender, spiral cord appears immediately anterior to the summit, increasing rapidly in size until, on the last volution, it is about equal to the other two. In addition to the spiral sculpture, the whorls are marked by strong, axial ribs equaling the spiral cords in strength. Of these ribs, 16 occur upon all but the penultimate turn, which has 18. The junctions of the axial ribs and spiral cords form prominent, cusp-like tubercles, while the spaces inclosed between them form large, squarish pits. Suture strongly impressed. Periphery of the last whorl marked by a strong keel, separated from the supraperipheral cord by a sulcus as wide as that which separates the supraperipheral from the median cord and, like it, crossed by the continuations of the axial ribs which terminate at the posterior border of the peripheral cord. Base short, concave, bearing a slender fasciole at the insertion of the columella. Entire surface of spire and base crossed by numerous fine, incremental lines. Aperture subquadrate, very strongly channeled anteriorly; posterior angle obtuse; outer lip rendered sinuous by the external sculpture, which is apparent in the aperture; columella short and broad, twisted, the free edge reflected; parietal wall glazed with a thin callus.

The type (Cat. No. 160079, U.S.N.M.) comes from San Diego, California. It is not quite mature, has six post-nuclear whorls, and measures: Length 4 mm., diameter 1.6 mm. Another specimen (Cat. No. 162044, U.S.N.M.) comes from San Clemente Island, California.

## CERITHIOPSIS (CERITHIOPSIDA) ROWELLI, new species.

Plate 40, fig. 6.

Shell elongate-conic, pale brownish yellow. Nuclear whorls large and tumid extending considerably beyond the lateral outline of the first post-nuclear whorl; the first half volution, smooth, well rounded; the remaining one and a half decidedly inflated, strongly rounded, crossed by very strong acute axial ribs which are about one-third as wide as the strongly impressed intercostal spaces that separate them. Of these ribs, about 17 are on the last turn. Post-nuclear whorls slopingly shouldered, below the appressed summit marked by three tuberculate, spiral keels which divide the spaces between the sutures into four equal rows. In addition to the spiral keels, the whorls are marked by strong, broad axial ribs, the intersection of which with the spiral keels appear as prominent cusps. Of these ribs, 16 occur upon the first and second, 18 upon the third, 20 upon the fourth and penultimate turn. The individual tubercles of all three keels are truncated posteriorly and slope gently and regularly to the anterior border. The spaces inclosed by the axial ribs and spiral keels are well impressed, squarish pits. Suture strongly constricted; periphery of the last whorl marked by a prominent, smooth keel; base short, almost flat, smooth, excepting lines of growth and a slender fasciole about the base of the columella. Aperture irregularly ovate; decidedly channeled anteriorly; posterior angle acute; outer lip rendered decidedly sinuous by the external sculpture; columella very broad at base, somewhat twisted and sinuous, the anterior edge slightly reflected; parietal wall glazed with a thin callus.

The type (Cat. No. 15559) was taken from *Haliotis* by Rowell, exact locality not known. The label bears the legend "West coast of North and Middle America." It probably came from California. It has six post-nuclear whorls and measures: Length 4.5 mm., diameter 1.8 mm.

## CERITHIOPSIS (CERITHIOPSIDELLA) COSMIA Bartsch.

Plate 38, fig. 7.

*Cerithiopsis cosmia* BARTSCH, Proc. U. S. Nat. Mus., vol. 33, 1907, pp. 180-181.

Shell elongate-conic, variegated with various shades of brown, white, and wax yellow. Nuclear whorls three and one-half, slender, lending the apex a mucronate appearance. First nuclear whorl smooth, second crossed by feeble axial riblets. The riblets increase considerably in size in the remaining turns, where they are very regularly developed and evenly spaced. These riblets are strongly protractive as they pass from summit to suture, the extremity at the suture being considerably in advance of the extremity at the summit. In addition to the vertical riblets, microscopic, crinkly lines appear in the intercostal spaces

which intersect the riblets in oblique even curves at right angles. The transition from the nuclear to the post-nuclear sculpture is abrupt, the three chief tuberculate spiral keels being present from the very beginning of the first post-nuclear turn. On the first four post-nuclear turns the posterior spiral keel is less developed than the rest, but it increases with each succeeding turn and finally becomes the strongest of the three. The tubercles on the early whorls are almost round and slope abruptly, concavely posteriorly and are gently well rounded anteriorly. On the later whorls they are oblong, with their long axis vertical. Channels separating the spiral keels about as wide as the keels on the early whorls, less so in the later turns, curved by the low, broad, strong, backward-slanting, axial riblets. The spaces between these ribs and the spiral keels appear as rounded pits. Sutures well impressed. Periphery of the last whorl marked by a strong spiral keel. Base well rounded, marked by three equal and equally spaced, spiral keels separated by equally wide and strong channels. The entire surface of the spire and base are marked by microscopic lines of growth and spiral striations. Aperture sub-quadrate, posterior angle obtuse, decidedly channeled at the junction of the short, thick, somewhat twisted columella and outer lip.

This description is based upon two specimens, cotypes, Cat. No. 195196, U.S.N.M. One has the nucleus and eleven post-nuclear whorls, and has furnished the description of the nucleus. This measures: Length 7.3 mm., diameter 2.3 mm. The other has lost its nucleus and probably the first two post-nuclear turns, and measures: Length 9 mm.; diameter 2.9 mm.

*Specimens examined.*

Catalogue No.	Locality.	Number of specimens.
160870	Monterey, California.....	1
56012	.....do.....	1
56008	.....do.....	3
160677	Catalina Island, California.....	2
195197	San Pedro Bay, California.....	5
<sup>1</sup> 195196	Whites Point, San Pedro Bay, California.....	33
195190	San Pedro Bay, California.....	1
153057a	Government Jetty, San Diego, California.....	3
198601	San Diego, California.....	5
109365	.....do.....	2
195171	San Diego, California (dredged 12-15 fathoms).....	2
198757	Southern California.....	1
32392	Todos Santos Bay, Lower California.....	3
198972	.....do.....	1

<sup>1</sup> Cotypes.

**CERITHIOPSIS (CERITHIOPSIDELLA) ANTEFILOSA, new species.**

Plate 40, fig. 9.

Shell elongate-conic, light chestnut brown. Nuclear whorls three and one-half, moderately rounded, separated by a poorly defined suture; the first one smooth, the next two and one-half with slender



closely spaced axial threads and fine, spiral lirations in the intercostal spaces. Post-nuclear whorls slightly rounded, marked by three tuberculate spiral cords of which the posterior one is at the summit, the anterior at some little distance posterior to the suture, while the third is about median between the two. The posterior cord is very poorly developed on the early whorls, in fact quite absent on the first volution, but grows steadily in size until, in the last volution, it is as strong as the other two. In addition to the spiral cords, the whorls are marked by vertical axial ribs which are as strong as the spiral cords and render the junction with them tuberculate. Of these ribs, 14 occur upon the first to third, 16 upon the fourth, 18 upon the fifth and sixth, 20 upon the seventh to ninth, 22 upon the tenth, and 24 upon the penultimate turn. The tubercles of the posterior cord are well rounded, that of the median slightly truncated posteriorly, while on the anterior cord they appear truncated in the middle, sloping gently anteriorly and very suddenly posteriorly. Sutures strongly constricted; periphery of the last whorl marked by a sulcus which is as wide as the spaces that separate the keels on the spire and like them is crossed with the continuations of the axial ribs. Base short, well rounded, marked by four spiral keels which grow gradually weaker and a little closer spaced from the periphery to the umbilical area, the last one forming a slender basal fasciole about the insertion of the columella. In addition to the spiral sculpture, the base is marked by numerous fine incremental lines. Aperture rhomboidal; decidedly channeled anteriorly; posterior angle acute; outer lip thin, rendered wavy by the external sculpture; columella moderately long, stout, decidedly curved, and somewhat twisted.

The type (Cat. No. 195200, U.S.N.M.) has lost the first two nuclear whorls, the thirteen remaining whorls measuring: Length 6.9 mm., diameter 1.8 mm., and comes from 8 miles off Point Loma Light, California, U. S. Bureau of Fisheries station 4310, and was dredged in 71 to 75 fathoms on gray mud and fine sand bottom. The early nuclear whorls were described from a young specimen (Cat. No. 195201, U.S.N.M.) from Whites Point, San Pedro Bay. Three other specimens (Cat. No. 195202, U.S.N.M.) were dredged in 12 to 15 fathoms off San Diego.

**CERITHIOPSIS (CERITHIOPSIDELLA) ALCIMA, new species.**

Plate 39, fig. 2.

Shell elongate-conic, chestnut brown. Nuclear whorls three and one-half, small, moderately rounded, separated by a well-impressed suture; the first whorl smooth; the second and third marked by slender, protractive, curved, axial ribs, of which 18 occur upon the second and 20 upon the third. Intercostal spaces about twice as wide as the axial ribs, crossed by about 15 slender, spiral lirations.



Post-nuclear whorls moderately rounded, appressed at the summit, ornamented with three spiral cords, of which the first is at the summit, which on the first five whorls is scarcely apparent; beginning with the sixth turn, it increases in size until on the last volution it almost equals the other two. The third cord is about as far posterior to the suture as it is from the second cord, which is halfway between the first and third. The spiral cords are not quite as wide as the spaces that separate them. In addition to the spiral cords, the whorls are marked by low, almost vertical, axial ribs, which are less strong than the spiral cords and render their intersections with these cuspidate. Of the axial ribs, 16 occur upon the second to fourth, 18 upon the fifth and sixth, 20 upon the seventh, 22 upon the eighth, and 24 upon the ninth and penultimate turn. The tubercles formed by the junction of the first cord and the axial ribs are well rounded; those formed by the junction of the median cord and the ribs are truncated anteriorly and posteriorly, sloping a little more gently anteriorly than posteriorly; those formed by the junction of the third cord and the ribs are decidedly truncated posteriorly, sloping gently anteriorly. The spaces inclosed between the axial ribs and the spiral cords are strongly impressed, squarish pits. Suture well marked, showing the posterior edge of the peripheral cord. Periphery of the last whorl marked by a strong cord, separated from the supraperipheral cord by a sulcus almost as wide as that which separates the supraperipheral cord from the median and, like it, crossed by the continuations of the axial ribs which terminate at the posterior border of the peripheral cord. Base rather short, concave, marked by two, strong, spiral cords and a slender fasciole, the latter surrounding the columella at its insertion, while the former divides the space between it and the peripheral cord into equal areas. In addition to the above sculpture, the entire base and spire are marked by numerous slender, incremental lines. Aperture irregularly subquadrate, strongly channeled anteriorly; posterior angle obtuse; outer lip thin, rendered sinuous at the edge by the external sculpture, which is apparent in the aperture; columella short, stout, twisted, with the free edge reflected; parietal wall glazed with a thin callus.

The type has ten post-nuclear whorls and measures: Length 7.2 mm., diameter 1.2 mm. It and twenty-one additional specimens (Cat. No. 195198, U.S.N.M.) come from Whites Point, San Pedro, California. Cat. No. 195199, U.S.N.M., contains four specimens, also from San Pedro, California.

## CERITHIOPSIS EXCELSA Dall.

Plate 36, fig. 1.

*Cerithiopsis excelsus* DALL, Prof. Paper No. 59, U. S. Geol. Surv., 1909, p. 75.

Shell very large, elongate-conic. (Nuclear whorls decollated.) Post-nuclear whorls appressed at the summit, well rounded, marked by poorly developed, rounded, almost vertical, axial ribs, of which 12 occur upon the first three of the remaining whorls, 14 upon the fourth to sixth, 16 upon the seventh, 20 upon the eighth, 24 upon the ninth, and 32 upon the penultimate turn. In addition to these axial ribs, the shell is provided at irregular intervals with long varices. The spiral sculpture consists of slender cords. These are of several strengths. On the eighth whorl there are four equally strong, which divide the space between the sutures into four subequal parts. The first of these cords is at the summit. In addition to these four there are four more spiral cords, less strong than those just mentioned, occupying the space midway between the other cords. On the penultimate whorl additional slender threads, which are still weaker, occur between the spirals just mentioned. The junctions of the axial ribs and the spiral cords, particularly the stronger, form feeble, rounded nodules. Suture strongly constricted. Periphery of the last whorl marked by a spiral cord as strong as the strongest between the sutures. Base well rounded, marked by six equal and equally spaced spiral cords, in the spaces between which a slender spiral thread is present. The aperture is obstructed by the matrix and is strongly channeled anteriorly; outer lip slightly expanded and thickened; columella short and stout.

The type (Cat. No. 107400, U.S.N.M.) comes from the Oregonian Eocene of North Fork of Umpqua River, at Schrum's Ranch, station 2798. It measures: Length 20.5 mm., diameter 6.5 mm.

## CERITHIOPSIS CURTATA, new species.

Plate 36, fig. 3.

Shell small, elongate-ovate, light brown. Nuclear whorls decollated. Post-nuclear whorls moderately rounded, ornamented with three spiral keels, of which the first is at the summit, the next immediately adjacent to it, being separated from it by a strong, incised line only, on all but the last whorl; on this it is a little more distant. The third keel is immediately above the suture. In addition to the spiral keels, the whorls are marked by slightly retractive, axial ribs which are almost equal to the spiral keels in strength. Of these ribs, 14 occur upon the second, 16 upon the third, 18 upon the fourth, 20 upon the fifth and the penultimate whorl. The junctions of the axial ribs and spiral keels form prominent tubercles which are truncated posteriorly and slope gently anteriorly, while the spaces inclosed

between them are moderately large, rounded pits. The last whorl is considerably contracted anteriorly, which gives the oval outline to the shell. Sutures strongly channeled. Periphery of the last whorl marked by a strong, spiral cord, which is smooth. Base moderately produced, bearing a strong, spiral cord at the insertion of the columella. Aperture small, irregularly ovate, very strongly channeled anteriorly; posterior angle obtuse; outer lip thick within, thin at the edge, rendered sinuous by the external sculpture; columella moderately long, stout, twisted, revolute and reflected.

The type (Cat. No. 195186, U.S.N.M.) has seven post-nuclear whorls and measures: Length 2.5 mm., diameter 1.0 mm. It was dredged at U. S. Bureau of Fisheries station 2813, in 40 fathoms, on coral sand bottom, bottom temperature 81°, off the Galapagos Islands.

*CERITHIOPSIS FOSSILIS*, new species.

Plate 38, fig. 3.

Shell elongate, subcylindrical. (Nuclear whorls decollated.) Post-nuclear whorls almost flattened, marked by three equal and equally spaced tuberculated spiral cords, of which one is at the summit, another at some little distance above the periphery, while the third is median between the two. In addition to the spiral cords, the whorls are crossed by almost vertical axial riblets which are as strong as the spiral cords and render them tubercular at their junction. Of these ribs 26 occur upon the penultimate turn and the one preceding it, 24 on the next two, 22 upon the next, and 20 upon the first of the remaining turns. The spaces inclosed between the spiral cords and axial ribs are strongly impressed, rounded pits. Sutures moderately constricted, showing the posterior edge of the first basal cord as a slender thread in all of the whorls. Periphery of the last whorl marked by a channel, which is as broad as those that separate the spiral cords on the spire and like them crossed by the continuation of the axial ribs. Base short, almost concave near the columella, marked by three equal and equally spaced spiral cords. Aperture (?) decidedly channeled anteriorly; posterior angle acute; outer lip fractured; columella, stout, curved, and twisted.

The type (Cat. No. 195193, U.S.N.M.) has seven whorls remaining, and measures: Length 7.2 mm., diameter 2.6 mm. It comes from the Lower San Pedro Series of Dead Man's Island, California.

*CERITHIOPSIS GLORIOSA*, new species.

Plate 36, fig. 7.

Shell elongate-conic, flesh-color, variegated with flecks of brown; the early whorls are light brown, while the base is dark chestnut. (Nuclear whorls decollated.) Post-nuclear whorls marked by three

strong sublamellar keels, which are not quite as wide as the spaces that separate them. The first of these is near to the appressed summit, the third quite a bit anterior to the suture, while the second occupies the space midway between these two. In addition to these keels, the whorls are marked by slightly protractive, axial ribs which are equal to the spiral cords in strength. Of these ribs, 16 occur upon the first to fifth, 18 upon the sixth, 20 upon the seventh, 22 upon the eighth, 24 upon the ninth, and 26 upon the penultimate turn. The junctions of the axial ribs and spiral cords form strong, cusp-like tubercles, which are suddenly truncated posteriorly and slope gently anteriorly; the spaces between them are deep, squarish pits. Sutures moderately constricted, showing the peripheral cord on all the turns. Periphery of the last whorl marked by a very strong, spiral keel, the space between which and the first suprapерipheral keel is almost as wide as that separating the suprapерipheral keel from the median, and, like that, is crossed by the continuations of the axial ribs which extend prominently to the posterior termination of the peripheral keel. Base marked by a slender, basal fasciole which surrounds the insertion of the columella, the space between the fasciole and the peripheral cord being concave. Aperture irregularly oval, very strongly channeled anteriorly; posterior angle obtuse; outer lip thin, showing the external sculpture within, rendered decidedly sinuous at the edge by the external sculpture; columella short and stout, the edge reflected; parietal wall glazed with a thin callus.

The type (Cat. No. 213301, U.S.N.M.) comes from California without definite designation of locality. It has eleven post-nuclear whorls (having lost the nucleus and probably the first post-nuclear turn) and measures: Length 8.6 mm., diameter 2.4 mm.

**CERITHIOPSIS COLUMNA** Carpenter.

Plate 36, fig. 6.

*Cerithiopsis columna* CARPENTER, Rept. Brit. Ass. Adv. Sci., 1864, p. 660; Ann. Mag. Nat. Hist., ser. 3, vol. 15, 1865, p. 32.

Shell elongate-conic, light chestnut brown. (Early whorls decolored.) Succeeding turns very slightly rounded, marked by three tuberculate spiral keels, of which one is at the summit, another a little above the periphery, and a third a little nearer the posterior than its supra-sutural neighbor. These keels are separated by spiral grooves, which are only about one-third as wide as the keels. In addition to the spiral keels, the whorls are marked by almost vertical axial ribs, which are about two-thirds as strong as the spiral cords and very closely spaced. Of these, 16 occur upon the second and third, 18 upon the fourth, 22 upon the fifth and sixth, 24 upon the seventh, 26 upon the eighth and 32 upon the penultimate turn. The narrow spaces inclosed between the ribs and spiral cords appear as small,



well impressed, rounded pits. Suture moderately constricted, showing the posterior edge of the first basal keel in the early whorls. Periphery of the last whorl marked by a sulcus as wide as those that separate the keels on the spire, and the continuation of the axial ribs. Base short, well rounded, marked with three slender spiral keels which are situated on the posterior two-thirds and separated by shallow channels. The first of these is crossed by slender continuations of the axial ribs. The space immediately about the base of the columella is free of sculpture excepting fine, incremental lines. Aperture subquadrate, decidedly channeled anteriorly; posterior angle acute; outer lip rendered sinuous by the external sculpture; columella very broad at base, stout, somewhat twisted and curved and the edge reflected.

Doctor Carpenter's type (Cat. No. 14823*b*, U.S.N.M.) was collected by J. G. Swan at Neah Bay, Washington, and measures: Length 9.2 mm., diameter 2.6 mm.

*Specimens examined.*

Catalogue No.	Locality.	Number of specimens.
<sup>1</sup> 14823 <i>b</i>	Neah Bay, Washington.....	1
32218	Vancouver Island.....	3
14823 <i>c</i>	Monterey, California.....	1
32398	Monterey Harbor, California.....	2
56007	Monterey, California.....	3

<sup>1</sup> Type.

**CERITHIOPSIS INFREQUENS C. B. Adams.**

Plate 37, fig. 1.

*Cerithium infrequens* C. B. ADAMS, Ann. N. Y. Lyc. Nat. Hist., vol. 5, 1852, p. 383.

Shell small, broadly elongate-conic, blackish-red. Nuclear whorls five, well-rounded, smooth. Post-nuclear whorls marked by three strong, spiral cords which are about half as wide as the spaces that separate them. The first of these is a little anterior to the summit, and the second is a little nearer the first than the third, which is about as far removed from the second as it is from the suture. In addition to the spiral cords, the whorls are marked by decidedly retractive, axial ribs which are about as wide as the cords. Of these ribs, 12 occur upon the second, 14 upon the third, 16 upon the fourth and fifth, 18 upon the sixth and seventh, and 20 upon the penultimate turn. The junctions of the axial ribs and the spiral cords form well-rounded tubercles, while the spaces inclosed between them are deep, rounded pits. Suture strongly impressed. Periphery of the last whorl marked by a sulcus as wide as that which separates the third from the second cord and, like it, crossed by the continuations of the



axial ribs which terminate at the posterior border of the first basal keel. Base moderately long, somewhat concave, marked by three strong, sublamellar keels, the first of which borders the peripheral sulcus, while the other two are a little less strong and situated close together on the middle of the base. Aperture large, subquadrate, decidedly channeled anteriorly; posterior angle obtuse; outer lip rendered sinuous by the external sculpture which is apparent within the aperture; columella moderately long, curved, and twisted.

The type, which is at Amherst College, Massachusetts, has nine post-nuclear whorls and measures: Length 3.25 mm., diameter 1.13 mm. It and another specimen were collected by Prof. C. B. Adams at Panama.

*CERITHIOPSIS PARAMOEAE*, new species.

Plate 38, fig. 4.

Shell moderately large, broadly elongate-conic, brown. (Nuclear whorls decollated.) Post-nuclear whorls appressed at the summit, ornamented with three nodulose, spiral cords which are about as wide as the spaces that separate them. The first of these is at the summit, the third is on the anterior fourth between the sutures, while the second is halfway between the two. In addition to the spiral cords, the whorls are marked by axial ribs almost equalling the spiral cords in strength; of these ribs, 16 occur upon the first and second, 18 upon the third, 20 upon the fourth, 22 upon the fifth, and 32 upon the penultimate turn. The junctions of the axial ribs and spiral cords form nodules which on the early whorls are well rounded and on the last elongate, their long axes corresponding with the axial sculpture. The spaces inclosed between them are well rounded pits. Sutures moderately impressed, showing the posterior edge of the first basal cord. Periphery of the last whorl marked by a sulcus almost as wide as that separating the supraperipheral from the median cord, and, like it, crossed by the continuations of the axial ribs. Base well rounded, smooth except for the feeble cord immediately below the peripheral sulcus. Aperture irregularly oval, decidedly channeled anteriorly; posterior angle obtuse; outer lip rendered somewhat sinuous by the external sculpture; columella short, curved, with the free edge reflected; parietal wall glazed with a thin callus.

The type (Cat. No. 15582, U.S.N.M.) comes from Neah Bay, Washington. It has lost the nucleus and probably the first one and a half post-nuclear turns. The eight remaining whorls measure: Length 6.3 mm., diameter 2.1 mm.

*CERITHIOPSIS BICOLOR*, new species.

Plate 38, fig. 6.

Shell small, elongate-conic, white, excepting the base of the posterior row of tubercles which is light brown. (Nuclear whorls decollated.) Post-nuclear whorls flat, marked by three spiral rows of tubercles, of which one is at the summit of the whorls, another immediately above the peripheral sulcus, and the third a little nearer the one at the summit than its anterior neighbor. These tubercles are connected by narrow bands into a spiral cord and axially by slender riblets, the two inclosing well-impressed squarish pits. Of these tubercles, 16 occur upon the first four of the remaining turns, 18 upon the fifth to seventh, and 20 upon the eighth and the penultimate turn. Suture strongly constricted. Periphery of the last whorl marked by a slender spiral cord. Base smooth. Aperture rhomboidal, decidedly channeled anteriorly; posterior angle obtuse; outer lip rendered sinuous by the external sculpture, columella short, strong and twisted.

The type has lost the nucleus and several of the early post-nuclear whorls; the ten remaining measure: Length 4 mm., diameter 1.2 mm. The type and three specimens (Cat. No. 195214, U.S.N.M.) were dredged at U. S. Bureau of Fisheries station 2813 in 40 fathoms on coral sand bottom, bottom temperature  $81^{\circ}$  off Galapagos Islands.

*CERITHIOPSIS ARNOLDI*, new species.

Plate 39, fig. 3.

Shell elongate-conic. (Nuclear whorls decollated.) The post-nuclear whorls slightly rounded, ornamented by three tuberculate spiral keels of which one is at the summit, the anterior at some little distance above the suture, and the third halfway between the two. The posterior of these three keels is much weaker than the other two on the early turns, but gradually increases in size until on the last volution it is practically equal to them. In addition to the spiral keels, the whorls are marked by somewhat protractive axial ribs, which are about as strong as the spiral keels and render them tuberculate at their junction. Of these ribs, 14 occur upon the first of the remaining turns, 16 upon the third, 18 upon the fourth, 20 upon the fifth, 22 upon the sixth, 24 upon the seventh and eighth, and 26 upon the penultimate turn. The spaces inclosed between the ribs and spiral cords are strongly impressed rounded pits. Sutures moderately constricted, showing the posterior edge of the first basal cord. Periphery of the last whorl marked by a deep sulcus, as wide as those occurring between the spiral cords on the spire and, like them, crossed by the continuations of the axial ribs. Base very short, almost flattened, somewhat concave near the columella,

marked by two spiral cords of which the first is immediately below the peripheral sulcus, while the next, which is less strong, is separated from it by a narrow channel. The anterior limit of this cord is a mere impressed line. There is another impressed line a little anterior to this one. Aperture decidedly channeled anteriorly; posterior angle obtuse (outer lip fractured); columella short, stout, curved, and slightly twisted.

The type (Cat. No. 195195, U.S.N.M.) has nine and a half post-nuclear whorls remaining and measures: Length 5.4 mm., diameter 1.8 mm. It comes from San Pedro Bay, California

Named for Dr. Ralph Arnold.

*CERITHIOPSIS MAGELLANICA*, new species.

Plate 38, fig. 8.

Shell broadly elongate-conic, light brown. (Nuclear whorls decollated.) Post-nuclear whorls appressed at the summit, not shouldered, well rounded, ornamented with three low, broad, spiral keels, which are at least twice as wide as the spaces that separate them. The first of these keels is a little below the summit, the second is median, and the third a little anterior to the suture. The middle keel is about one and one-fourth times as wide as the other two, which are equal. In addition to this spiral sculpture, the whorls are marked by decidedly curved, somewhat retractive, low, rounded, axial ribs. Of these, 20 occur upon the second of the remaining turns, 24 upon the third, 26 upon the fourth and fifth, 28 upon the sixth, and 30 upon the penultimate turn. The junctions of the axial ribs and spiral cords form low, elongated tubercles, which have their long axes parallel with the axial sculpture. The spaces inclosed between the axial ribs and spiral cords are shallow, rounded pits. Sutures moderately constricted, showing the basal cord. Periphery of the last whorl marked by a slender groove as wide as those separating the first suprapерipheral cord from the median and, like them, crossed by the feeble continuations of the axial ribs. Base of the last whorl well rounded, marked by at least two low, very feeble, broad, spiral cords on the posterior half; the anterior half apparently smooth. Aperture quite large, decidedly channeled anteriorly; posterior angle obtuse; outer lip rendered sinuous by the external sculpture; columella very curved and reflected; parietal wall glazed with a thin callus.

The type has the last eight post-nuclear whorls and measures: Length 8.5 mm., diameter 2.5 mm. It and another specimen (Cat. No. 96224, U.S.N.M.) come from the U. S. Bureau of Fisheries station 2778, in 61 fathoms, sand bottom, bottom temperature 48°, from the Straits of Magellan.

*CERITHIOPSIS ANTEMUNDA*, new species.

Plate 36, fig. 4.

Shell elongate-conic, brown. (Nuclear whorls decollated.) Post-nuclear whorls appressed at the summit, very slightly rounded, marked by three spiral cords, of which the first—which is at a little distance anterior to the summit—is obsolete on the first four whorls, giving them a decidedly shouldered appearance, while on the last turn it is almost equal to the other two. The second cord is a little posterior to the middle between the sutures, while the third one is a little posterior to the suture. The spaces between these spiral cords are about double the width of the spiral cords. In addition to the spiral sculpture, the whorls are marked by slender, well rounded, retractive axial ribs, equaling the spiral cords in strength. Of these ribs, 14 occur upon the first to fourth, 16 upon the fifth and sixth, and 20 upon the penultimate turn. The junctions of the axial ribs and spiral cords form well-rounded tubercles, while the spaces inclosed between them are strongly impressed, squarish pits. Sutures strongly channeled, showing the posterior edge of the peripheral cord. Periphery of the last whorl marked by a strong, spiral cord, which is separated from the supraperipheral cord by a sulcus as wide as that which separates the supraperipheral from the median cord, and like it is crossed by the continuations of the axial ribs, which extend to the posterior edge of the peripheral cord. Base concave, with a slender fasciole surrounding the insertion of the columella and marked axially with fine, incremental lines, which also extend over the entire surface of the spire. Aperture sub-quadrate, strongly channeled anteriorly; posterior angle decidedly obtuse; outer lip thin, showing the external sculpture within, rendered sinuous at the edge by the external sculpture; columella stout, twisted, with the edge reflected; parietal wall covered with a thin callus.

The type and another specimen (Cat. No. 195188, U.S.N.M.) come from San Pedro Bay, California. The type has lost the nucleus. The eight whorls remaining measure: Length 5 mm., diameter 1.9 mm. Another specimen (Cat. No. 213313, U.S.N.M.) was dredged by the U. S. Bureau of Fisheries steamer *Albatross* at station 2932 in 20 fathoms on sand bottom, bottom temperature 58°, off San Diego, California.

*CERITHIOPSIS DIOMEDEÆ*, new species.

Plate 37, fig. 5.

Shell small, elongate-conic, brown. (Nuclear whorls decollated.) Post-nuclear whorls with a strongly channeled suture in which the posterior edge of the peripheral cord is apparent on all the whorls; marked by three spiral cords, of which the first is considerably weaker than the other two and is situated at the summit, rendering this some-



what shouldered; the third is about as far posterior to the suture as it is removed from the median, while the second is halfway between the first and third. The spaces between the spiral cords are equal and about one and one-half times as wide as the cords. In addition to the spiral sculpture, the whorls are marked by well-rounded, slender, protractive, axial ribs which are almost equal to the spiral cords in strength. Of these ribs, 16 occur upon the first, 18 upon the second to fourth, 20 upon the fifth and sixth, and 24 upon the penultimate turn. The junctions of the axial ribs and spiral cords form moderately strong, rounded tubercles, while the spaces inclosed between them are rectangular pits having their long axes parallel with the spiral sculpture. Periphery of the last whorl marked by a strong, spiral cord which is separated from the suprapерipheral cord by a channel as wide as that which separates the suprapерipheral cord from the median and, like it, is crossed by the axial ribs which terminate at the posterior edge of the peripheral cord. Base very long, concave, marked by incremental lines and a single, obsolete fasciole a little posterior to the insertion of the columella. Aperture irregularly oval; posterior angle very obtuse; outer lip thin, showing the external sculpture within by transmitted light, rendered sinuous at the edge by the external sculpture; columella long, curved and twisted, the edge reflected; parietal wall glazed with a thick callus.

The type and another specimen (Cat. No. 213302, U.S.N.M.) were dredged by the U. S. Bureau of Fisheries steamer *Albatross* at station 3566 in 3 fathoms on sand and shell bottom, bottom temperature 58°, in San Diego Bay, California. The type has lost the early nuclear whorls, only a portion of the last remaining. It has eight post-nuclear whorls and measures: Length 4.3 mm., diameter 1.5 mm.

CERITHIOPSIS WILLIAMSONI Arnold.

Plate 39, fig. 6.

*Bittium williamsoni* ARNOLD, Mem. California Acad. Sci., vol. 3, 1903, p. 295, pl. 6, fig. 11.

Shell minute, elongate-ovate. Post-nuclear whorls ornamented with three spiral cords, of which the first, which is the weakest, is at the summit; the second is considerably nearer to the one at the summit than the third, which is about halfway between the second and the suture. In addition to the spiral sculpture, the whorls are marked with slender, almost vertical, axial ribs, of which about 16 occur upon the first and second, 18 upon the third, 20 upon the fourth, and 22 upon the penultimate whorl. The junctions of the axial ribs and spiral cords form well-rounded tubercles, those on the median cord appearing somewhat truncated anteriorly and posteriorly. The spaces inclosed between the spiral cords and axial ribs are squarish pits. Sutures moderately constricted, showing the pos-



terior edge of the peripheral cord. Periphery marked by a strong spiral cord which is separated from the supraperipheral cord by a sulcus as wide as that which separates the supraperipheral cord from the median and, like it, crossed by the extensions of the axial ribs, which terminate at the posterior edge of the peripheral cord. Base slightly concave, with two strong spiral cords. Aperture broadly, irregularly oval, decidedly channeled anteriorly; posterior angle obtuse; columella somewhat curved and twisted, with the free edge reflected.

Doctor Arnold's type, which came from the Pleistocene of San Pedro, was lost in transit to the U. S. National Museum, had seven post-nuclear whorls and measured: Length 2.5 mm., diameter 1 mm.

Named for Mrs. M. Burton Williamson, of Los Angeles, California.

*CERITHIOPSIS TRUNCATA* Dall.

Plate 40, fig. 2.

*Cerithiopsis stejnegeri truncata* DALL, Proc. U. S. Nat. Mus., vol. 9, 1886, p. 304, pl. 4, fig. 5.

Shell wax yellow. (Nucleus and early whorls decollated.) The four remaining well rounded, ornamented with three tuberculate spiral keels of which the median is the strongest; the weakest is at the summit, which it crenulates. The last is midway between the suture and the median cord. In addition to the spiral cords, the whorls are marked by low, well rounded, vertical, axial ribs, the intersection of which with the spiral cord renders them feebly tuberculate. Of these ribs, 30 occur upon the penultimate whorl and 22 upon the preceding turns. The spaces inclosed between the spiral cords and the axial ribs are squarish, well impressed pits. A slender thread of the base is apparent in the somewhat constricted suture. Periphery of the last whorl marked by a sulcus which is about as wide as the spaces between the first and median cord and is crossed by feeble continuations of the axial ribs. Base short, well rounded, with a slender fasciole at the insertion of the columella; entire surface of spire and base crossed by rather strong, incremental lines and numerous fine spiral striations; aperture broadly ovate; decidedly channeled anteriorly; posterior angle obtuse; outer lip rendered wavy by the external sculpture; columella short, very broad, curved; parietal wall glazed with a thin callus which extends from the columella to the posterior angle.

The type (Cat. No. 213303, U.S.N.M.) and two specimens were collected in the canals of sponges at Unalaska. The type measures: Length 3.1 mm., diameter 1.9 mm. Nine specimens (Cat. No. 213304, U.S.N.M.) collected at the same locality under similar conditions. Doctor Dall noted when he collected the specimens that

the apices, though intact, were of a gelatinous consistency, and, when removed from the alcohol in which the shells were preserved, dried up, shriveled, and fell off.

CERITHIOPSIS STEPHENSÆ Bartsch.

Plate 39, fig. 7.

*Cerithiopsis stephensi* BARTSCH, Proc. U. S. Nat. Mus., vol. 37, 1909, pp. 399-400, fig.

Shell elongate-conic, chocolate brown. (Nuclear whorls decolored in all the specimens seen.) Post-nuclear whorls well rounded, ornamented spirally by four keels between the sutures, of which the posterior three are strong and tuberculate, the fourth smooth and slender. Axially the whorls are marked by irregular ribs, the junctions of which with the spiral keels form tubercles. The posterior row of tubercles is at the summit and is the weakest, the individuals appearing as rounded knobs. The second is on the middle of the whorl. This and the first, which is immediately above the peripheral sulcus, have their tubercles of about equal strength. On these two keels the tubercles slope gently anteriorly and very abruptly posteriorly. The peripheral sulcus and the other two sulci are equally strong and wide. All are crossed by the ribs, which, however, do not extend over the base. Both spiral cords and ribs are crossed by strong incremental lines. Sutures constricted. Periphery of the last whorl marked by a deep channel. Base well rounded, rather short, marked by strong incremental lines and a few very fine spiral striations. The summit of the succeeding whorl drops a little below the peripheral sulcus in all the whorls of the spire and allows a narrow margin of the smooth base to appear as a cord in the suture. Aperture ovate, with a strong anterior sinus, outer lip thin, showing the external sculpture within; columella stout, twisted and curved, having a weak basal fasciole at its insertion.

*Type*.—Cat. No. 204008, U.S.N.M. It has twelve post-nuclear whorls and measures: Length 9 mm., diameter 2.1 mm. It and two additional specimens in Mrs. Kate Stephens's collection were collected by her at Bear Bay, Peril Strait, Baranoff Island, Alaska. Four more were collected by her at Mole Harbor, Alaska, one of which is in the collection of the U. S. National Museum (Cat. No. 204009). Another in her collection comes from the head of Port Frederick, Chichagoff Island, Alaska.

Cat. No. 126659, U.S.N.M., contains three specimens from Victoria, Vancouver Island, British Columbia. Cat. No. 133233, U.S.N.M., contains five specimens from Port Orchard, Puget Sound, Washington.

Named for Mrs. Kate Stephens, of San Diego, California.

*CERITHIOPSIS MONTEREYENSIS*, new species.

Plate 41, fig. 5.

Shell small, broadly conic, light brown. (Nuclear whorls decollated.) Post-nuclear whorls marked by three spiral cords, the first of which (which is very poorly developed, in fact almost obsolete on the early whorls) is at the summit, while the next is separated from it by a narrow channel, the third being about as far posterior to the suture as the second is from the first, and the space between the second and third being double the width of that between the first and second. In addition to the spiral cords, the whorls are marked by vertical, axial ribs which are equal to the spiral cords in strength. Of these ribs, 15 occur upon the second and third, 16 upon the fourth and fifth, 18 upon the sixth, and 22 upon the penultimate turn. The junctions of the axial ribs and spiral cords form cusp-like tubercles, while the spaces inclosed between them are very elongate rectangular pits between the first and second spiral cord, and strongly impressed, squarish pits between the second and third. Suture well impressed. Periphery of the last whorl marked by a narrow keel which is separated from the suprapерipheral keel by a sulcus as wide as that separating the first from the second spiral cord, and crossed by the continuations of the axial ribs which terminate at its posterior border. Base short, slightly rounded, ornamented with three narrow, spiral keels, of which the first two are much stronger than the other. These keels are equally spaced between the periphery and the middle of the base, which is occupied by the last one. In addition to the above sculpture, the entire surface of spire and base is marked by numerous, fine incremental lines. Aperture subquadrate, decidedly channeled anteriorly; posterior angle obtuse; outer lip rendered strongly wavy by the external sculpture, which is apparent in the aperture; columella short, stout, curved and decidedly twisted, the free edge reflected; parietal wall glazed with a thin callus.

The type (Cat. No. 32395, U.S.N.M.) comes from Monterey Harbor, California. It has eight post-nuclear whorls and measures: Length 3.2 mm., diameter 1.3 mm.

*CERITHIOPSIS INGENS* Bartsch.

Plate 41, fig. 4.

*Bittium quadrifilatum ingens* BARTSCH, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 180.

Shell large, elongate-conic, white. Nuclear whorls decollated. Post-nuclear whorls slightly shouldered at the summit, moderately well rounded, marked on the first three turns by three spiral cords. On the fourth turn a fourth cord makes its appearance at the summit, rapidly increasing in strength until on the last three whorls it is quite equal to the other cords. These spiral cords are almost as wide as

the spaces which separate them. In addition to the spiral cords, the whorls are marked by rather poorly developed, rounded, axial ribs, of which 14 occur upon the first, 16 upon the second, 18 upon the third and fourth, 20 upon the fifth and sixth, 22 upon the seventh and eighth, and 24 upon the penultimate turn. The intersections of the spiral cords and axial ribs form rather rounded cusps which slope more gently anteriorly than posteriorly, while the spaces inclosed between them are rather shallow, quadrangular pits having their long axes parallel with the spiral sculpture. Sutures moderately constricted, showing the posterior edge of the first basal cord. In addition to the above sculpture, the entire surface of the spire is marked by very slender lines of growth and, on the last whorl, by very slender, intercalated, spiral lirations between the cords. Periphery of the last whorl marked by a channel equal to the space between the cords on the spire. Base moderately long, well rounded, ornamented with six, strong, spiral keels which decrease regularly in size and spacing from the periphery to the columella. Aperture irregularly oval, strongly channeled anteriorly; posterior angle acute; outer lip thin, showing the external sculpture within, rendered decidedly wavy at the edge by the external sculpture; columella moderately long, somewhat twisted, and reflected; parietal wall covered with a thick callus.

The type (Cat. No. 32213, U.S.N.M.) comes from Monterey, California. It has lost the nucleus and probably the first post-nuclear turn; the ten remaining turns measure: Length 12.5 mm., diameter 4:2 mm.

CERITHIOPSIS TUMIDA Bartsch.

Plate 41, fig. 3.

*Bittium tumidum* BARTSCH, Proc. U. S. Nat. Mus., vol. 33, 1907, pp. 179-180.

Shell medium size, light yellowish-brown, shining. Nuclear whorls decollated. Post-nuclear whorls somewhat inflated, well rounded, separated by a constricted suture and ornamented with strong tuberculate axial ribs, of which there are 18 upon the second of the remaining whorls and 22 upon the penultimate turn. In addition to the axial ribs there are four, unequally broad, low, spiral ridges between the sutures, which are much wider than the spaces which separate them, the latter appearing as strongly incised lines. The intersection of these ridges and the ribs form the tubercles. The whorls slope gently from the second spiral ridge toward the summit and the first row of tubercles, which is only feebly developed and is located on the sloping shoulder. The second set of tubercles are rounded, while the third and fourth rows are decidedly elongated. Periphery of the last turn marked by a strong smooth spiral keel, which is separated from the supraperipheral keel by a mere constriction. Base rather short, without keel, marked only by lines of growth.



Aperture suboval, decidedly channeled anteriorly; outer lip rendered sinuous by the external sculpture; columella short, very broad, and slightly expanded at the insertion, a little lighter in color than the rest of the shell; provided with a strong callus on its inner edge which is reflected over the parietal wall.

The type (Cat. No. 74001, U.S.N.M.) was collected by Canfield at Monterey, California. It has eight post-nuclear whorls and measures: Length 4.2 mm., diameter 1.7 mm. A second immature specimen (Cat. No. 23261, U.S.N.M.) is in the Stearns collection, also from Monterey, California.

CERITHIOPSIS PERUVIANA Orbigny.

Plate 41, fig. 2.

*Cerithium peruvianum* ORBIGNY, Voy. Amer. Mérid., 1840, p. 443, pl. 77, figs. 9 and 10.

Shell broadly elongate-conic, grayish-brown. Nuclear whorls small, at least two. Post-nuclear whorls moderately rounded, ornamented with four nodulose, spiral cords, of which the first (which is at the summit) is much smaller than the rest, the other three being subequal. On the last two turns the first basal cord is apparent in the suture. In addition to the spiral cords, the whorls are marked by low, axial ribs, which are about as wide as the spiral cords. Of these ribs, 12 occur upon the first and second, 14 upon the third, 18 upon the fourth, and 22 upon the penultimate turn. The junctions of the axial ribs and the spiral cords form well-developed tubercles. Sutures moderately constricted. Periphery of the last whorl marked by a feeble, tuberculated, spiral cord. Base slightly concave in the middle, marked by five broad, low, rounded cords, which decrease regularly in size from the periphery to the columella. Aperture rather large, irregularly oval, decidedly channeled anteriorly; posterior angle obtuse; columella very stout, twisted, and reflected; parietal wall covered with a thin callus.

Orbigny's type came from the shore near Arica, Peru. It has six post-nuclear whorls, and measures: Length 7 mm., diameter 2 mm.

CERITHIOPSIS DESTRUGESI De Folin.

Plate 41, fig. 6.

*Cerithium destrugesi* DE FOLIN, Le Meleagrinicoles, 1867, p. 71, pl. 6, fig. 12.

Shell elongate-conic; early whorls yellow, the later ones darker. Early post-nuclear whorls ornamented with four spiral keels, which are much wider than the spaces that separate them. Of these, the one at the summit and the third are of equal size and considerably less strong than the other two, which are also equal. On the last six turns the third cord becomes divided, the anterior portion being a little stronger than its neighbor. In addition to the spiral sculpture



the whorls are marked by somewhat retractive, broad, axial ribs, which render the junctions with the spirial cords strongly cuspidate. Of these ribs, about 12 occur on the first to fifth, 14 upon the sixth, 18 upon the seventh to tenth, 20 upon the eleventh and twelfth, and 22 upon the penultimate whorl. Suture moderately constricted. Periphery of the last whorl marked by a slender sulcus, which is crossed by the continuations of the axial ribs. Base moderately long, concave, ornamented with four strong, rounded, spiral cords, the first of which is immediately below the peripheral sulcus, and the last surrounds the insertion of the columella. These cords grow successively weaker from the periphery to the columella. Aperture irregularly subquadrate, decidedly channeled anteriorly; posterior angle obtuse; outer lip rendered sinuous by the external sculpture; columella rather long, curved and twisted, the free edge reflected.

De Folin's type was taken from pearl oysters which are said to have come from Panama or Negritos Island. (The last may be intended for Negros Island, Philippines.) It has 14 whorls, and measures: Length 6 mm., diameter 1.8 mm.

#### EXPLANATION OF PLATES.

The measurements cited after each species constitute the actual length of the figured specimen.

##### PLATE 36.

- Fig. 1. *Cerithiopsis* (subgenus?) *excelsa*; type; 20.5 mm.; p. 352.  
2. *Cerithiopsis* (*Cerithiopsis*) *oxyis*; type; 3.5 mm.; p. 332.  
3. *Cerithiopsis* (subgenus?) *curtata*; type; 2.5 mm.; p. 352.  
4. *Cerithiopsis* (subgenus?) *antemunda*; type; 5 mm.; p. 359.  
5. *Cerithiopsis* (*Cerithiopsis*) *fatua*; type; 6 mm.; p. 331.  
6. *Cerithiopsis* (subgenus?) *columna*; type; 9.2 mm.; p. 354.  
7. *Cerithiopsis* (subgenus?) *gloriosa*; type; 8.6 mm.; p. 353.

##### PLATE 37.

- Fig. 1. *Cerithiopsis* (subgenus?) *infrequens*; type; 3.25 mm.; p. 355.  
2. *Cerithiopsis* (*Cerithiopsis*) *sorex*; type; 1.6 mm.; p. 333.  
3. *Cerithiopsis* (*Cerithiopsis*) *albonodosa*; type; p. 337.  
4. *Cerithiopsis* (*Cerithiopsis*) *abreojosensis*; type; 2.3 mm.; p. 338.  
5. *Cerithiopsis* (subgenus?) *diomedex*; type; 4.3 mm.; p. 359.  
6. *Cerithiopsis* (*Cerithiopsis*) *cerea*; type; 2.4 mm.; p. 333.  
7. *Cerithiopsis* (*Cerithiopsis*) *tuberculoides*; type; 3.75 mm.; p. 336.

##### PLATE 38.

- Fig. 1. *Cerithiopsis* (*Cerithiopsis*) *pupiformis*; cotype; 1.9 mm.; p. 337.  
2. *Cerithiopsis* (*Cerithiopsis*) *pedroana*; cotype; 5.2 mm.; p. 335.  
3. *Cerithiopsis* (subgenus?) *fossilis*; type; 7.2 mm.; p. 353.  
4. *Cerithiopsis* (subgenus?) *paramæa*; type; 6.3 mm.; p. 356.  
5. *Cerithiopsis* (*Cerithiopsis*) *pupiformis*; cotype; p. 337.  
6. *Cerithiopsis* (subgenus?) *bicolor*; type; 4 mm.; p. 357.  
7. *Cerithiopsis* (*Cerithiopsidella*) *cosmia*; cotype; 9 mm.; p. 348.  
8. *Cerithiopsis* (subgenus?) *magellanica*; type; 8.5 mm.; p. 358.  
9. *Cerithiopsis* (*Cerithiopsis*) *carpenteri*; cotype; 8.1 mm.; p. 334.

## PLATE 39.

- Fig. 1. *Cerithiopsis* (*Cerithiopsina*) *necropolitana*; type; 7.7 mm.; p. 345.  
2. *Cerithiopsis* (*Cerithiopsidella*) *aleima*; type; 7.2 mm.; p. 350.  
3. *Cerithiopsis* (subgenus?) *arnoldi*; type; 5.4 mm.; p. 357.  
4. *Cerithiopsis* (*Cerithiopsis*) *galapagensis*; type; 2.4 mm.; p. 340.  
5. *Cerithiopsis* (*Cerithiopsis*) *cesta*; cotype; 5.8 mm.; p. 341.  
6. *Cerithiopsis* (subgenus?) *williamsoni*; type; 2.5 mm.; p. 360.  
7. *Cerithiopsis* (subgenus?) *stephensæ*; type; 9 mm.; p. 362.  
8. *Cerithiopsis* (*Cerithiopsis*) *berryi*; type; 3.4 mm.; p. 339.

## PLATE 40.

- Fig. 1. *Cerithiopsis* (*Cerithiopsis*) *aurea*; type; 7 mm.; p. 344.  
2. *Cerithiopsis* (subgenus?) *truncata*; type; 3.1 mm.; p. 361.  
3. *Cerithiopsis* (*Cerithiopsis*) *stejnegeri*; type; 5.5 mm.; p. 342.  
4. *Cerithiopsis* (*Cerithiopsida*) *diegensis*; type; 4 mm.; p. 347.  
5. *Cerithiopsis* (*Cerithiopsis*) *neglecta*; type; 3.2 mm.; p. 343.  
6. *Cerithiopsis* (*Cerithiopsida*) *rowelli*; type; 4.5 mm.; p. 348.  
7. *Cerithiopsis* (*Cerithiopsis*) *stejnegeri* *dina*; type; 7 mm.; p. 343.  
8. *Cerithiopsis* (*Cerithiopsis*) *halia*; type; 4.5 mm.; p. 344.  
9. *Cerithiopsis* (*Cerithiopsidella*) *antefilosa*; 6.9 mm.; p. 349.

## PLATE 41.

- Fig. 1. *Cerithiopsis* (*Cerithiopsina*) *adamsi*; type; 2.1 mm.; p. 346.  
2. *Cerithiopsis* (subgenus?) *peruviana*; type; 7 mm.; p. 365.  
3. *Cerithiopsis* (subgenus?) *tumida*; type; 4.2 mm.; p. 364.  
4. *Cerithiopsis* (subgenus?) *ingens*; type; 12.5 mm.; p. 363.  
5. *Cerithiopsis* (subgenus?) *montereyensis*; type; 3.2 mm.; p. 363.  
6. *Cerithiopsis* (subgenus?) *destrugesi*; type; 6 mm.; p. 365.